

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE SPECIFICATION

The specification has been amended to correct the minor informality pointed out by the Examiner, as well as to correct an obvious clerical error.

No new matter has been added, and it is respectfully requested that the amendment to the specification be approved and entered, and that the objection to the specification be withdrawn.

THE CLAIMS

Claims 1, 15 and 20 have been amended to recite subject matter formerly recited in (now canceled) claims 6 and 7.

In addition, claims 1-4 and 10-16 and 18-22 have been amended to make some minor grammatical improvements and/or to correct some minor antecedent basis problems so as to put them in better form for issuance in a U.S. patent.

No new matter has been added, and it is respectfully requested that the amendments to claims 1-4 and 10-16 and 18-22 be approved and entered.

THE OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTION

Claims 1-22 were rejected under the doctrine of obviousness-type double patenting as not being patentably distinct from claims 1-27 of copending application Serial No. 10/634,380, and claims 1-22 were also rejected under the doctrine of obviousness-type double patenting as not being patentably distinct from claims 1-27 of copending application Serial No. 10/479,009.

According to the present invention as recited in each of amended independent claims 1, 15 and 20, the catalyst layer (which is provided on an inner surface of the groove formed in the first surface of the first substrate) has a protrusion protruding outward from the first surface of the first substrate, a concave portion in the second substrate is formed to receive the protrusion of the catalyst layer, and the second substrate contacts the first surface of the first substrate so as not to contact the protrusion.

It is respectfully submitted that the claims of Serial No. 10/634,380 and the claims of Serial No. 10/479,009 do not recite or suggest these features of the present invention, as recited in amended independent claims 1, 15 and 20.

Accordingly, it is respectfully submitted that claims 1-22 of the present application are clearly patentably distinguishable from the claims of Serial No. 10/634,380 and the claims of Serial

No. 10/479,009, and it is respectfully requested that the obviousness-type double patenting rejection be withdrawn.

THE PRIOR ART REJECTION

Claims 1-22 were all rejected under 35 USC 102 or under 35 USC 103 as being anticipated by or obvious in view of each one of US 2002/0094462 ("Shioya et al"), US 2003/0138685 ("Jankowski et al"), and USP 6,786,716 ("Gardner et al"). These rejections, however, are respectfully traversed with respect to the claims as amended hereinabove.

According to the present invention as recited in amended independent claim 1, a compact chemical reactor comprises: (i) a first substrate including a first surface and a groove formed in the first surface; (ii) a catalyst layer which is provided on an inner surface of the groove formed in the first surface of the first substrate, and which has a protrusion protruding outward from the first surface of the first substrate; and (iii) a second substrate including a surface which contacts the first surface of the first substrate, and a concave portion formed in the surface of the second substrate to receive the protrusion of the catalyst layer such that the second substrate contacts the first surface of the first substrate so as not to contact the protrusion. Amended independent claims 15 and 20, moreover, recite similar features along the lines of amended independent claim 1.

Thus, as shown in Fig. 2, for example, a protrusion of a catalyst layer provided in a groove of a first substrate protrudes from a first surface of the first substrate, and a concave portion is formed in a second substrate such that the second substrate does not contact the protrusion. With this structure, the protrusion of the catalyst layer does not interfere with contact between the first and second substrates, and as a result the first substrate can satisfactorily contact the second substrate.

It is respectfully submitted that none of the cited references disclose, teach or suggest these features of the present invention as recited in amended independent claims 1, 15 and 20.

By contrast, Shioya et al merely discloses the use of "fine particles" of catalyst in paragraph [0091] thereof, and the use of an un-shown catalyst for the reaction in the reforming reaction flow path 164 in paragraph [0262] thereof. However, Shioya et al does not disclose, teach or suggest a catalyst layer having a structure that includes a projection in the manner of the claimed present invention, or a concave portion to receive a projection of a catalyst layer, in the manner of the claimed present invention.

Jankowski et al, moreover, discloses a catalyst (e.g. catalyst 75 in Fig. 5 thereof), and Gardner et al discloses a

catalyst 110 provided on a membrane 120. However, neither Jankowski et al nor Gardner et al discloses, teaches or suggests putting the catalyst in a groove, as recited in claims 1, 15 and 20. Clearly, therefore, Jankowski et al and Gardner et al do not disclose, teach or suggest a catalyst layer which is provided on an inner surface of the groove formed in the first surface of the first substrate, and which has a protrusion protruding outward from the first surface of the first substrate, in the manner of the claimed present invention.

It is respectfully submitted, moreover, that none of the other prior art of record discloses, teaches or suggests the features of the present invention as recited in amended independent claims 1, 15 and 20.

In view of the foregoing, it is respectfully submitted that the present invention as recited in amended independent claims 1, 15 and 20, and claims 2-14, 16-19 and 21-22 respectively depending therefrom, clearly patentably distinguishes over Shioya et al, Jankowski et al and Gardner et al, taken singly or in any combination, under 35 USC 102 as well as under 35 USC 103.

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Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

/Douglas Holtz/

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